

In the Claims

1. (Currently Amended) A method for creating reusable composite components from interpreted pages of rendered document during dynamic document construction comprising:

a) obtaining a list of document components from said page and identifying any non-cached components;

b) caching individual reusable document components (RDCs) rendered to their respective bounding box dimensions;

c) permuting said reusable document components RDCs into composite combinations of reusable document components RDCs;

d) caching each of composite reusable document component RDC rendered relative to each other in a bounding box of sufficient size to adequately contain the combination;

e) combining reusable document components RDCs in their relative positions to form composite reusable underlays RULs; and

f) caching said composite reusable underlays RULs rendered to full page size.

2. (Currently Amended) A method for rendering pages having a combination of reusable components and non-cached components, comprising:

a) assessing said rendered page for the possibility of having an underlay-overlay pair;

b) searching a cache of reusable underlays RULs for underlays having the reusable document components RDCs needed by the page;

c) if the correct reusable underlay RUL is not found in cache then generating a composite reusable underlay RUL from the reusable document components RDCs of said page and caching said reusable underlay RUL rendered to full page size;

d) creating a full page size overlay from the non-cached components that is retained until it is mated with the cached reusable underlay RUL;

- e) if the correct underlay is found in cache then retrieving the reusable underlay RUL; and along with the overlay
 - d) rendering, along with the overlay, the page therefrom.

3. (Currently Amended) An electro-photographic method comprising:
receiving a page description language (PDL) representation of a print job;
converting the page description language PDL representation into a print job
pixel map;

 during the converting and responsive to identifying a reusable document
component (RDC) hint, searching an reusable document component RDC repository for
a corresponding reusable document component RDC or composite reusable document
 component RDC pixel map, or a reusable underlay (RUL) and either integrating a found
corresponding pixel map into the print job, or rasterizing the identified reusable
 document component RDC to generate a pixel map, integrating the generated pixel
map into the print job, storing the generated pixel map in the reusable document
 component RDC repository, and generating a reusable underlay RUL therefrom; and

 electro-photographically printing the print job pixel map.

4. (Currently Amended) The electro-photographic method as in claim 3, further
comprising maintaining a repository index identifying contents of the reusable document
 component RDC repository, wherein the step of searching of the reusable document
 component RDC repository for a pixel map includes searching the repository index.

5. (Currently Amended) The electro-photographic method as in claim 3, wherein
the integrating of a found corresponding pixel map into the print job pixel map includes:
marking the found corresponding pixel map in the reusable document component RDC
repository to prevent its deletion prior to the integrating of the found corresponding pixel
map into the print job pixel map.

6. (Currently Amended) The electro-photographic method as in claim 3, wherein
the converting of the page description language PDL representation into a print job pixel

map includes: compressing the print job pixel map during the converting; and prior to the optical drawing, decompressing the compressed print job pixel map.

7. (Currently Amended) The electro-photographic method as in claim 3, wherein the page description language is one of Variable data Intelligent Postscript Printware language VIPP and Personalized Print Markup Language PPML.

8. (Currently Amended) An apparatus for processing documents each represented by a document description encoded in a page description language supportive of reusable data, comprising:

a page description language interpreter that receives the document description and parses the document description into reusable document components and which combines said components into composites of reusable components and reusable underlays;

an imager, communicating with the interpreter, that creates image representations of received document components; and

a reusable document component repository that stores image representations derived from a plurality of processed documents, the reusable document component repository communicating with the interpreter and the imager to supply those ones of the image representations corresponding to selected document components of the processed documents and to receive selected image representations created by the imager during the processing of documents;.

9. (Currently Amended) The apparatus for processing documents as in claim 8, further comprising a graphical user interface (GUI) through which an associated user manages the reusable document component repository, the managing including selectively adjusting a repository storage size and selectively deleting image representations.

10. (Original) The apparatus for processing documents as in claim 8, further comprising a compressor that receives and compresses image representations created

by the imager, and communicates the compressed image representations to the reusable document component repository.

11. (Original) The apparatus for processing documents as in claim 10 wherein the compressor is integrated into the imager.

12. (Original) The apparatus for processing documents as in claim 8, further comprising a random access memory cache communicating with the interpreter and the reusable document component repository, the random access memory storing at least one most recently used image representation retrieved by the interpreter.

13. (Original) The apparatus for processing documents as in claim 8, further comprising a repository index that indexes image representations stored in the reusable document component repository, the repository index communicating with the interpreter to identify images to be retrieved.

14. (Original) The apparatus for processing documents as in claim 13, further comprising a ping path between the interpreter and the reusable document component repository by which the interpreter pings the reusable document component repository responsive to the repository index indicating that a selected image representation is contained in the reusable document component repository, the pinging directing the reusable document component repository not to delete of the selected image representation.

15. (Original) The apparatus for processing documents as in claim 14, wherein the repository index is integrated into the page description language interpreter.

16. (Original) The apparatus for processing documents as in claim 8, further comprising a printing station that includes the page description language interpreter, the imager, and the reusable document component repository; and an electronic network by which the printing station receives documents for processing.

17. (Original) A document construction method comprising:

receiving a document description including at least one selected reusable document component and combining said components into composites of reusable components and reusable underlays;

querying a reusable document component repository containing stored image representations of reusable document components to locate a selected stored image representation corresponding to the selected reusable document component;

conditional upon the querying,

identifying one of the stored image representations as corresponding to the selected reusable document component and retrieving the selected stored image representation corresponding to the selected reusable document component, or,

not identifying one of the stored image representations as corresponding to the selected reusable document component, generating an image representation for the selected reusable document component, and storing the generated image representation in the reusable document component repository; and

converting the document description to a document image representation, the converting including incorporating the selected or generated image representation corresponding to the selected reusable document into the document image representation.

18. (Original) The document construction method as in claim 17, wherein the step of storing the generated image representation in the reusable document component repository includes associating a life span parameter with the generated image representation; and responsive to an expiration of the life span parameter, removing the corresponding generated image representation from the reusable document component repository.

19. (Original) The document construction method as in claim 18, wherein the step of associating a life span parameter with the generated rasterized image includes

associating one of a temporal life span and an indication of permanence with the generated image representation.

20. (Original) The document construction method as in claim 18, wherein the life span parameter is such that the generated image representation remains available in the reusable document component repository for reuse in the construction of subsequent documents.

21. (Original) The document construction method as in claim 17, responsive to a selected user input, further comprising removing the generated image representation from the reusable document component repository.

22. (Original) The document construction method as in claim 17, wherein the querying includes tracking previously generated image representations; and conditional upon the tracking indicating that a previously generated image representation corresponds to the selected reusable document component, verifying the previously generated image representation currently resides in the reusable document component repository.

23. (Original) The document construction method as in claim 22, wherein the querying further includes conditional upon a successful verifying, marking the previously generated image representation to prevent a removing thereof.

24. (Original) The document construction method as in claim 17, wherein the storing of the generated image representation in the reusable document component repository includes, prior to the storing, compressing the image.

25. (Currently Amended) The document construction method as in claim 17, further comprising storing at least a portion of the reusable document component repository in a random access memory (RAM) cache.

26. (Currently Amended) The document construction method as in claim 17, further comprising storing the reusable document component repository on a permanent storage device; and storing most recently accessed image representations in a random access memory (~~RAM~~) cache.

27. (Original) The document construction method as in claim 17, further comprising identifying the selected reusable document component as reusable by detecting a reusable document component hint associated with the reusable document component.

28. (Currently Amended) The document construction method as in claim 27, wherein the document description is encoded in a Variable data Intelligent Postscript Printware language (~~VIPP~~).

29. (Currently Amended) The document construction method as in claim 27, wherein the document description is encoded in a Personalized Print Markup Language (~~PPML~~).